Docket No.: E0366.70005US00
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	John J. Hart III
Serial No.:	09/826,157
Confirmation No.:	4012
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For:	METHOD AND SYSTEM FOR DATA DELIVERY AND REPRODUCTION
Examiner:	M. J. Pyzocha
Art Unit:	2137

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Dated: March 5, 2007

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This Brief is filed in furtherance of a Notice of Appeal filed on October 2, 2006. This appeal follows an adverse decision from a Pre-Appeal Brief Request for Review mailed on December 4, 2006. A petition is enclosed for extension of time, measured from the date that is one month of the mailing of that decision.

The fees required under § 41.20(b)(2) and fees for an extension of time are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

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I. REAL PARTY IN INTEREST

The real party in interest for this appeal is:

ECD Systems, Inc.

II. RELATED APPEALS, INTERFERENCES, AND JUDICIAL PROCEEDINGS

There are no other appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 33 claims pending in the application.

B. Current Status of Claims

1. Claims canceled: 1-111, 118-119
2. Claims withdrawn from consideration but not canceled: None
3. Claims pending: 112-117, 120-146
4. Claims allowed: None
5. Claims rejected: 112-117, 120-146

C. Claims On Appeal

The claims on appeal are claims 112-117, 120-146

IV. STATUS OF AMENDMENTS

Applicant did not file an Amendment After Final Rejection. All amendments submitted have been entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The invention relates to watermarking title data, such as audio, image, and video title data. A watermark is data that is embedded in title data in a manner that is intended to be imperceptible to a person using the title data. The manner in which the watermark data is embedded is generally kept secret so that the watermark only can be extracted from watermarked title data by one who knows the secret of how the data was embedded.

One use of watermarks described in the application is to identify a particular purchaser of the title data. By embedding watermark data that identifies a purchaser of the title data, illegal copies of watermarked title data can be traced back to their source. Fear of detection deters a purchaser of a copy of the title data from illegitimately making and distributing copies of the title data.

However, the particular manner by which the watermark is embedded in the title data has a significant impact on its effectiveness. The watermark should minimally alter the title data so as not to interfere with use of the title data, but should simultaneously be robust in that the watermark should not be rendered unusable even if the title data is modified through data compression or other means. Further, the method used to embed the watermark should lead to a watermark that is difficult to detect, even with extensive analysis of the watermarked title data. If the watermark could be detected, it could be removed and therefore defeated as a deterrent to illegal copying.

Of course, Applicants make no claim to having invented watermarking. However, they have invented a new and improved method of watermarking title data and a resulting computer readable medium encoded with watermarked title data. The three independent claims on appeal describe two methods for watermarking title data and a computer-readable medium comprising watermarked title data. The claims recite a method for watermarking title data that makes the watermark imperceptible, or nearly so, to the user, that makes the watermark robust even in the face of modifications of the title data, and that prevents those tempted to illegally copy the title data from discerning the watermarking method.

One feature of the method for watermarking the title data described in the present application is that the watermark is stored at one or more selected locations in the title data and not throughout the title data (page 30, line 19 – page 31, line 11). This feature has at least two advantages over storing the watermark over the entire title data. First, if a user segments the title data into multiple pieces (for example, a snippet of a song or a portion of an image), it is more likely that the entire watermark will be contained within the segment as opposed to a portion of the watermark. Second, the locations can be selected to place the watermark in locations where it has an imperceptible effect on the title data as perceived by a human user.

However, these features, though offering advantages, are not without a downside. Using multiple placement locations selected based on characteristics of the title data makes it easier for an unauthorized user to detect the watermark through analysis of the watermarked title data, allowing the watermark to be more easily defeated.

Nonetheless, Applicants' method of watermarking does not suffer from these disadvantages because the method is a combination of features that, because of the combination, produce a method with desirable characteristics. The present application describes that the watermark is stored in the title data by modulating the title data with the watermark (page 32, line 28 – page 33, line 6). Further, rather than using a traditional modulation approach, which could result in title data in which the watermark data could be detected, a modulation relationship is selected to embed the watermark at each location (page 31, lines 18-31; page 32, lines 22-28). By using different modulation relationships at different locations, it becomes difficult to detect the watermark and circumvent the security created by the watermark. Further protection can be achieved by randomly selecting the modulation relationships used.

Thus, the total combination of features – not any single feature – leads to the desirable characteristics of the watermarking method. Accordingly, the claims are directed to methods reciting a combination of features and a computer-readable medium containing watermarked title data that has title data that has been watermarked using this combination of features.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claim 112, and therefore claims 113-129 and 142-146 that depend from claim 112, is properly rejected under 35 U.S.C. 103(a) over Moskowitz et al. (U.S. 5,889,868) in view of Senoh (U.S. 6,240,121) and further in view of Girod et al. (U.S. 5,809,139).

Whether claim 130 is properly rejected under 35 U.S.C. 103(a) over Moskowitz et al. (U.S. 5,889,868) in view of Senoh (U.S. 6,240,121) and further in view of Girod et al. (U.S. 5,809,139).

Whether claim 131, and therefore claim 132 that depends from claim 131, is properly rejected under 35 U.S.C. 103(a) over Moskowitz et al. (U.S. 5,889,868) in view of Senoh (U.S. 6,240,121) and further in view of Girod et al. (U.S. 5,809,139).

Whether claim 133, and therefore claims 134-139 that depend from claim 133, is properly rejected under 35 U.S.C. 103(a) over Moskowitz et al. (U.S. 5,889,868) in view of Senoh (U.S. 6,240,121) and further in view of Girod et al. (U.S. 5,809,139).

Whether claim 140, and therefore claims 141-146 that depend from claim 140, is properly rejected under 35 U.S.C. 103(a) over Moskowitz et al. (U.S. 5,889,868) in view of Senoh (U.S. 6,240,121) and further in view of Girod et al. (U.S. 5,809,139).

Whether claim 133, and therefore claims 134 and 137-139 that depend from claim 133, is properly rejected under 35 U.S.C. § 101 as "nonfunctional descriptive material."

Whether claim 135 is properly rejected under 35 U.S.C. § 101 as "nonfunctional descriptive material."

Whether claim 136 is properly rejected under 35 U.S.C. § 101 as "nonfunctional descriptive material."

Arguments for reversal for each of the above identified grounds for review are presented separately below. Accordingly, 112, 130, 131, 133, 135, 136 and 140 do not stand or fall together.

VII. ARGUMENT

Appellant respectfully requests that the Examiner's final rejection of all the claims be reversed. Claims 112-117, 120-132 and 140-146 each recite a combination of features that leads to a new and non-obvious method of watermarking title data. Claims 133-139 recite a computer-readable medium on which watermark data has been embedded in title data in a new and non-obvious way. Accordingly, all rejections of the claims should be reversed.

A. Prior Art Cited

The Examiner has cited multiple references related to watermarking. None of these references shows the combination of features described in the present application that provides a persistent watermark that is not perceptible to a human user and difficult to detect and remove by unauthorized means. Rather, the Examiner rejects the claims based on combinations of six different references, with none of the claims being rejected based on a combination of less than three references describing different watermarking processes.

Though five of the six cited references relate to watermarking, every rejection is constructed from excerpts of the watermark processes described in the individual references. In constructing such a rejection, the Examiner, in places, misinterprets the references to find within the references the features of the claimed method where, in fact, the references teach something different. For this reason, the rejections should be reversed.

As a further reason for reversal, the Examiner ignores what would be apparent to one of skill in the art of watermarking: the combination of steps in a watermarking method is critical to the results achieved. A feature desirable in one process, even if that process has desirable attributes, may not be desirable in a different process. The Examiner provides no motivation to select specific features of the individual references to combine as claimed. Rather, the Examiner uses the claims

and hindsight reasoning to pick and choose features of the references to construct a rejection. Such an analysis runs afoul of the caution of the M.P.E.P. to avoid "the tendency to resort to 'hindsight'" and to base a rejection only "on facts gleaned from the prior art" M.P.E.P. 2142. Accordingly, the rejections should be reversed.

The Examiner constructs the rejections using combinations of Moskowitz (U.S. 5,889,868), Senoh (U.S. 6,240,121), Girod (U.S. 5,809,139), Miller (U.S. 6,263,087) and Davis (U.S. 6,611,607), each relating to watermarking. The Examiner further cites Mizikovsky (U.S. 5,748,734) for teaching claim limitations relating to storing a watermark key in a secure database. As detailed in the sections below, these references do not, either alone or in combination, teach or suggest the combination of any claim.

B. Rejection Under 35 U.S.C. § 103(a) Over Moskowitz et al. (U.S. 5,889,868) in View of Senoh (U.S. 6,240,121) and Further in View of Girod et al. (U.S. 5,809,139)

The rejection of claims 112, 115-117, 122-123 and 126-146 under 35 U.S.C. § 103(a) over Moskowitz in view of Senoh and further in view of Girod should be reversed because no *prima facie* case of obviousness has been established.

1. Independent Claim 112

Claim 112 recites:

> 112. A method of watermarking title data with identification data, the method comprising the steps of:
> identifying a plurality of possible placement locations in the title data based on characteristics of the title data;
> selecting a plurality of placement locations from the plurality of possible placement locations;
> randomly selecting a plurality of number to frequency modulation relationships; and
> frequency modulating at least a portion of the title data at each of the plurality of selected placement locations with the

identification data using one of the selected plurality of number to frequency modulation relationships.

Independent claim 112 is rejected based on Moskowitz et al., in view of Senoh and further in view of Girod et al. The Examiner interprets Moskowitz, Senoh, and Girod as each showing some of the limitations of claim 112. However, when Moskowitz, Senoh, and Girod are properly interpreted, they do not show or suggest the features asserted by the Examiner. The references do not make a *prima facie* case of obviousness because they do not show, either alone or in combination, all the limitations of the claims.

As a separate reason why the references do not make a *prima facie* case of obviousness, there is no motivation to combine features from the references as claimed. Each of the three references describes a complete method of watermarking. While one of skill in the art could be motivated by the teachings of the references to use a method as taught by any one of the references, there is no motivation to pick and choose features from the references and combine them into a new method as claimed.

As to the interpretation of the references, the Examiner asserts that Moskowitz discloses "identifying a plurality of possible placement locations in the title data based on characteristics of the title data" and "selecting a plurality of placement locations from the plurality of possible placement locations," as recited in claim 112. Though the Examiner cites five passages in Moskowitz at which selection of placement locations is discussed, none of the cited passages describes an approach of selecting placement locations that meets the limitations of claim 112.

The passages of Moskowitz cited by the Examiner fall into one of three categories: those that describe random selection of placement locations for a watermark, those that describe optimal selection of placement locations and those that refer generally to selecting placement locations, without describing a selection method. Random selection and optimal selection are alternative approaches, neither of which is the same as identifying a plurality of possible placement locations based on characteristics of the title data and then selecting placement locations from the possible placement locations. The passages that merely refer to selecting placement locations do

not describe any approach and cannot be read as teaching or suggesting the specific approach recited in the claims. Thus, none of these passages, whether considered alone or in combination meets the limitations of the claim, that recite both "identifying a plurality of possible placement locations . . ." and "selecting a plurality of placement locations from the plurality of possible placement locations."

More specifically, the passage in Moskowitz at column 5, line 59-column 6, line 8, describes a range of choices for "planning" the placement of watermarks. Random placement is described as one possibility (col. 5, lines 64-65). As an alternative, "optimal planning of digital watermark insertion" (col. 5, lines 66-67) is mentioned. Optimal selection is also referenced in the passages at column 11, lines 22-26, which describes selecting the "most secure locations for placement of watermarks." Column 12, lines 19-25 also describes "optimal locations for watermarks." Another reference to random placement appears in the passage at column 7, lines 29-39, which describes random or pseudo-random selection of watermark locations based on a pseudo-random key. Column 10, lines 11-14 is also cited by the Examiner. That passage refers to "advantageous locations for the insertion of digital watermarks," but does not describe how such advantageous locations are selected.

The Examiner appears to equate the optimal selection approaches of Moskowitz with the claim limitation of "identifying a plurality of possible placement locations in the title data based on characteristics of the title data." The Examiner further seems to relate a random selection approach of Moskowitz with "selecting a plurality of placement locations from the plurality of possible placement locations," as recited in claim 112. However, such an interpretation of the reference is not proper. First, because the reference teaches the optimal selection approaches as alternative to random selection approaches, even if the Examiner's interpretation of the reference is correct, the reference does not teach or suggest a system in which both optimal selection and random selection is employed. Accordingly, there is no basis for concluding that the reference teaches one method that includes ***both*** "identifying a plurality of possible placement locations in the title data based on characteristics of the title data" ***and*** "selecting a plurality of placement locations from the plurality of possible placement locations." Second, the portions of Moskowitz that describe random selection

relate to randomly selecting locations in the title data, rather than selecting from a plurality of possible placement locations that have been identified. For these reasons, the cited passages of Moskowitz do not meet the limitations of the claim and the rejection of claim 112, under 35 U.S.C. § 103 should be reversed.

As a further reason that the rejection should be reversed, Senoh also does not teach the limitations of the claim asserted by Examiner. The Examiner asserts that Senoh teaches "randomly selecting a plurality of number to frequency modulation relationships" at column 22, lines 28-44. Contrary to the Examiner's assertion, that passage of Senoh describes a three-step process in which data to be watermarked first undergoes a frequency transform step to form an intermediate signal (see col. 2, line 31). The watermark data is inserted into the intermediate signal – not the original signal. A frequency inverse transform step is then applied to the intermediate signal. Though the passage describes using a random number to select a set of frequency components in the intermediate signal into which the watermark data is inserted, inserting data into a frequency component of the intermediate signal is not the same as modulating a placement location in the original signal.

Accordingly, Senoh does not teach frequency modulation at all. It necessarily follows that Senoh does not teach frequency modulation using a randomly selected frequency modulation relationship. And, without teaching of frequency modulation, or random selection of even one frequency modulation relationship, it necessarily follows that the reference does not teach random selection of a plurality of frequency modulation relationships. For these reasons, the cited passages of Senoh do not meet the limitations of the claim and the rejection of claim 112, under 35 U.S.C. § 103 should be reversed.

As a further reason that the rejection of claim 112 should be reversed, Girod also does not teach the features asserted by Examiner. The Examiner stated that Girod "teaches frequency modulating title data with identification data," but this is incorrect. Girod describes watermarking of compressed digital video bit streams that does not increase the bit rate of the signal (col. 2, lines 35-36). The method described in Girod involves processing the watermark data in two steps. First,

the watermark signal is "modulated by a pseudo-random noise sequence to spread it in the frequency domain" (col. 1, lines 64-66). Second, the watermark signal is compressed by using the same transform coding procedure that was used to compress the video data (col. 2, lines 1-3). After the watermark has been processed, the coefficients of the transformed watermark are ***added*** to the coefficients of the transformed video signal (see, col. 2, line 6, and summing node 38 in FIGS. 2, 2A and 3), and not frequency modulating title data with identification data as asserted by the Examiner.

Adding the transformed watermark signal to the transformed video signal is a different operation than ***frequency modulating*** the video signal with the watermark signal. The reference, therefore, teaches a different operation performed on a different signal. Thus, Girod does not teach "frequency modulating at least a portion of the title data," as recited in claim 112.

Therefore, the combination of Moskowitz and Senoh and Girod does not teach or suggest limitations of the claims, including "randomly selecting a plurality of number-to-frequency modulation relationships" and "frequency modulating at least a portion of the title data at each of the plurality of selected placement locations . . . using one of the selected plurality of number-to-frequency modulation relationships," as recited in claim 112. Because the references, even if combined, do not show all the limitations of claim 112, the rejection should be reversed.

Further, there is no motivation to combine Moskowitz and Senoh and Girod. The Examiner asserts that motivation would be found to combine Moskowitz and Senoh in the desire to make it difficult to detect the watermark data and then to add features from Girod "to allow watermarking of pre-compressed data." However, these asserted motivations are unrelated to the specific features selected from the references or the specific combination of features that is the claimed method. A *prima facie* case of obviousness does not exist unless there is a teaching or suggestion that would lead one skilled in the art at to extract features from the references and assemble them into the method of claim 112.

In this case, there is nothing in the references to suggest a connection between the selection of placement locations as described in Moskowitz and the processing of an intermediate signal as in Senoh. With no such connection, there is no basis for a conclusion that one of skill in the art would have understood that a desirable result would have been achieved by combining specific elements of Moskowitz with specific elements of Senoh as the Examiner has done to construct a rejection. Further, there is no teaching or suggestion that adding pre-compressed watermarked data as described in Girod could or would be used with a process other than the one described in Girod in which the title data is also pre-compressed. In short, though the Examiner states motivations for combining the references, the stated motivations are unrelated to the specific features – either in the context of the references from which those features were excerpted or in the context of the claimed method into which those features are combined.

Accordingly, Moskowitz, Senoh, and Girod are not properly combinable, which is a further reason why the rejection under 35 U.S.C. § 103 should be reversed.

2. Dependent Claim 130

Dependent claim 130 depends from independent claim 112 and adds a limitation that further distinguishes the references. The Examiner also rejected this claim based on Moskowitz et al., in view of Senoh and further in view of Girod et al., asserting that Senoh "discloses selecting an entry from a set of relationships" at column 2, lines 28-44. The Examiner's statement does not accurately describe Senoh, and even if it did, it would not teach the limitation of claim 130.

Claim 130 recites a limitation on how a number to frequency modulation relationship is randomly selected. Specifically, the claim recites "selecting an entry of a set of encoding relationships, the entry including random information specifying a selection of placement locations from the plurality of placement locations." In parsing the claim, it is apparent that there are multiple aspects not shown or suggested in Senoh. For example, the claim recites "a set of encoding relationships." An entry of this set is selected which provides both a number to frequency modulation relationship and "random information specifying selection of placement locations."

The cited passage of Senoh teaches inserting a watermark into a "first set of frequency components of the intermediate signal" through "determining, based on pseudo random numbers, the first set of frequency components of the intermediate signal into which the watermark data is inserted" (col. 2, lines 28-44). The "set" of Senoh is a set of frequency components in an intermediate signal and is unrelated to a set of encoding relationships as claimed. Of course, because Senoh does not describe a set of encoding relationships, it cannot describe a set of encoding relationships in which an entry provides random information specifying a selection of placement locations, as required by claim 130.

Because the references do not teach all limitations of claims 130, the rejection under 35 U.S.C. § 103 should be withdrawn.

3. Dependent Claim 131

Dependent claim 131 depends from claim 130, which in turn depends from claim 112. For the reasons given in conjunction with claims 130 and 112, claim 131 should be allowed. In addition, claim 131 qualifies claim 130 by reciting that each of the encoding relationships in the set of encoding relationships comprises the plurality of number to frequency modulation relationships. Thus, claim 131 recites that selecting an entry of the set results in both random information sued in the selection of placement locations and the plurality of number to frequency modulation relationships that are used to frequency modulate the title data. The cited passage of Senoh, describing selection of frequency components of an intermediate signal, bears no relationship to a set of entries that provides information on a modulation relationship and placement locations.

Thus, the rejection of claim 131 under 35 U.S.C. § 103 should be reversed.

4. Independent Claim 133

Claim 133 recites:

> 133. Computer-readable medium comprising watermarked title data that is watermarked with an identification code, the title data having at a plurality of locations the identification code modulated on the title data, with a different modulation scheme at each of the plurality of locations creating a random relationship between the identification code and modulation at each of the plurality of locations, and each of the plurality of locations being a random location within a group of available placement locations at which the watermarked title data has properties meeting at least one criterion.

Independent claim 133 is rejected based on Moskowitz et al., in view of Senoh and further in view of Girod et al. As detailed above in part 1 in connection with claim 112, the Examiner has incorrectly interpreted the references and has provided an inadequate basis for picking and choosing aspects of the references and combining them as claimed.

For similar reasons, the references do not teach or suggest a computer readable medium meeting all limitations of claim 133. Contrary to the Examiner's assertion, Moskowitz does not teach or suggest "the title data having at a plurality of locations the identification code modulated on the title data . . . each of the plurality of locations being a random location within a group of available placement locations at which the watermarked title data has properties meeting at least one criterion." The passages of Moskowitz cited by the Examiner that teach ***either*** random selection of placement locations ***or*** optimum selection of placement locations do not teach or suggest constructing a computer readable medium to have ***both*** an identification code modulated on title data at a plurality of locations ***and*** each of those plurality of locations being a random location within a group of available placement locations at which the watermark title data has properties meeting at least one criteria.

Contrary to the Examiner's assertion, neither Senoh nor Girod, either alone or in combination, teaches or suggests "a different modulation scheme at each of the plurality of locations creating a random relationship between the identification code and modulation at each of the

plurality of locations." Senoh's process of randomly selecting a set of frequency components on a transformed signal does not teach or suggest a random relationship between an identification code and modulation at each of the plurality of locations in the title data. Contrary to the Examiner's assertion, Girod does not teach or suggest any modulation scheme applied to the title data and therefore cannot teach or suggest a different modulation scheme at each of the plurality of locations.

Further, even if the Examiner's interpretation of the references were correct, there is no motivation to construct the specific combination of features of the claim. The Examiner's asserted motivation for the combination is the same as given in connection with claim 112. As described in section 1, above, the asserted motivations are unrelated to specific features – either in the context of the references from which those features were excerpted or in the context of the claimed method into which those features are combined. Accordingly, there is no motivation to combine features from Moskowitz, Senoh, and Girod to construct a computer-readable medium having the features claimed.

Accordingly, the rejection of claim 133 should be reversed.

5. Independent Claim 140

Claim 140 recites:

> 140. A method of watermarking title data with identification data, the method comprising:
> identifying a plurality of locations in the title data based on properties of the title data;
> randomly selecting a subset of placement locations from the plurality of identified locations;
> for each placement location in the subset:
> (i) randomly selecting one of a plurality of number to frequency modulation relationships;
> (ii) modulating the title data at the placement location with the identification data based on the selected number to frequency modulation relationship; and

storing an indication of the randomly selected subset of placement locations and randomly selected number to frequency modulation relationships.

Independent claim 140 is also rejected based on Moskowitz et al., in view of Senoh and further in view of Girod et al. As detailed above in part 1 in connection with claim 112, the Examiner has incorrectly interpreted the references and has provided an inadequate basis for picking and choosing aspects of the references in combining them as claimed.

The references also do not teach or suggest a method of watermarking title data meeting the limitations of claim 140. The Examiner cites against claim 140 the same passages of the references cited against claim 112. For reasons described in connection with claim 112, the Examiner has misinterpreted the references.

Contrary to the Examiner's assertions, Moskowitz does not teach or suggest "identifying a plurality of locations in the title data based on properties of the title data" and "randomly selecting a subset of placement locations from the plurality of identified locations." The alternative approaches in Moskowitz of ***either*** randomly selecting locations for watermark data ***or*** performing an optimum selection do not teach or suggest one method that includes ***both*** identifying a plurality of locations based on properties of the title data ***and*** randomly selecting a subset of placement locations.

Contrary to the Examiner's assertion, Senoh does not teach or suggest "for each placement location in the subset: (i) randomly selecting one of a plurality of number to frequency modulation relationships." Senoh's description of a random selection of frequency components in a transformed signal is not the same as randomly selecting a number to frequency modulation relationship and, even if it did, the reference would still not teach "randomly selecting one of a plurality of number to frequency modulation relationships," as claimed.

Contrary to the Examiner's assertion, Girod does not teach "modulating the title data at the placement location with the identification data based on the selected number to frequency modulation relationship." Girod's teaching of adding a compressed watermark to a compressed

digital video stream does not teach modulating title data at all and therefore cannot teach or suggest modulating title data based on a selected number to frequency modulation relationship.

Further, even if the Examiner's interpretation of the references were correct, there is no motivation to construct the specific combination of features of the claim. The Examiner's asserted motivation for the combination is the same as given in connection with claim 112. As described in section 1, above, the asserted motivations are unrelated to specific features – either in the context of the references from which those features were excerpted or in the context of the claimed method into which those features are combined. Accordingly, there is no motivation to combine features from Moskowitz, Senoh, and Girod to construct a method having the features claimed.

Because the references do not teach all limitations of claim 149, and there is no motivation to combine the selected features of the references, the rejection under 35 U.S.C. § 103 should be reversed.

6. Dependent Claim 139

Dependent claim 139 depends from claim 133 and adds a limitation that further distinguishes the references. Claim 133 recites that a different modulation scheme is used at each of a plurality of locations. Claim 139 further recites that the different modulation schemes are random. Though the Examiner asserts that Senoh at Col. 2, lines 28-44, teaches random modulation schemes, as described above, that passage of Senoh describes random selection of frequency components of an intermediate signal. It does not teach or suggest random modulation schemes.

For this additional reason, the rejection of claim 139 under 35 U.S.C. § 103 should be reversed.

C. Rejection Under 35 U.S.C. § 103(a) Over Moskowitz, Senoh, and Girod, and Further in View of Miller (U.S. 6,263,087)

1. Dependent Claim 120

Dependent claim 120 depends indirectly on independent claim 112, depending on intervening claims 115 and 117. Consequently, claim 120 contains limitations reciting in further detail how the plurality of possible placement locations are selected. The claim recites "scanning the audio title data to determine the plurality of locations where frequency deviation between channels of the audio title data is less than a predetermined frequency deviation or the frequency modulation of the audio title data is not discernible to a human ear. The claim further recites that scanning includes selecting a channel of the audio title data as a reference channel and selecting another channel of the audio title data to be frequency modulated." The Examiner rejected the claim, asserting that Miller discloses "the use of a reference and watermarked channel and decoding the watermark using the reference channel." The Examiner's statement does not accurately describe Miller and, even if it did, it does not create a *prima facie* case of obviousness. The cited passage of Miller, even if interpreted as the Examiner asserts, does not teach selecting a channel of the audio title data as a reference channel and selecting another channel of the title data to be frequency modulated.

Though Miller describes the use of multiple channels in the context of watermarking and describes a reference for each channel, the channels are used for constructing the watermark itself; in Miller, there is no reference channel.

The channels in Miller are part of a "method of converting . . . [messages composed of] bits into a vector suitable for a watermark" (col. 2, lines 6-7). The method involves "treat[ing] each bit as a separate channel" and additionally "assigning a separate 'reference signal' to each bit" (col. 2, lines 7-8, 16-17). Thus, there is no reference channel.

These multiple channels are used to construct the watermark. "The watermark is constructed by either adding or subtracting each reference signal according to whether the corresponding bit is 1 or 0, respectively" (col. 2, lines 19-21). To decode the watermark, the bits are

determined by performing a correlation with the reference signal for each and every bit (col. 2, lines 24-28).

In contrast, claim 120 recites "selecting a channel of the audio title data as a reference channel, and selecting another channel of the audio title data to be frequency modulated as a watermarked channel." Thus, there is clearly one channel that contains the watermark and another channel that does not. Miller's use of multiple channels to each contain a portion of the watermark does not teach or suggest selecting a watermarked channel and a reference channel as claimed.

Further, even if Miller did disclose the limitations of claim 120, the Examiner has not provided an adequate motivation for combining Miller with the other references. The Examiner asserted that the motivation "would have been to use correlations and thresholds to decode the watermark signal" (col. 2, lines 15-38). However, the cited passage describes comparing one of multiple reference signals to one of multiple watermarked channels. This asserted motivation is irrelevant to both the watermarking systems in the other references and to the other limitations of claim 120. The reference, therefore, provides no teaching or suggestion to make the combination as claimed.

Accordingly, Miller does not disclosed the claimed features and is not combinable with the other references, which are further reasons why the rejection of claim 120 under 35 U.S.C. § 103 should be reversed.

2. Dependent Claim 121

Dependent claim 121 depends indirectly on independent claim 112, depending on intervening claims 115, 117 and 120. Claim 121 adds a further limitation that the reference channel and the watermarked channel are randomly changed. The Examiner rejected the claim asserting that Miller discloses this limitation. However, as described above in connection with claim 120, the cited passage of Miller relates to placing watermark data in each of a plurality of channels. Though each of the channels has its own reference signal, Miller does not provide any

channel for a reference. Accordingly, Miller provides no teaching or suggestion of a method in which "the reference channel and the watermarked channel are randomly changed."

Accordingly, Miller does not disclosed the claimed feature, which is a further reason why the rejection of claim 121 under 35 U.S.C. § 103 should be reversed.

D. Rejection Under 35 U.S.C. § 101

1. Independent Claim 133

The Examiner rejected claim 133 under § 101 as non-statutory subject matter because "the arrangement of data on a computer readable medium . . . does not constitute statutory material." (OA at 2). Referring to M.P.E.P. 2106 (Rev. 3) (now at 2106.01 in Rev. 5), the Examiner stated that the "claimed watermark does not qualify as a data structure . . . and is therefore nonfunctional descriptive material, which is non-statutory under 35 U.S.C. § 101." (OA at 11).

Because the computer-readable medium of claim 133 falls within the definition of statutory subject matter under the M.P.E.P. and controlling legal precedent, the rejection of claim 133 should be reversed.

a. Claim 133 is Patentable Because it Meets the Requirements of §101

Under 35 U.S.C. § 101, patentable inventions include "any new and useful process, machine, manufacture, or composition of matter." Congress intended § 101 to extend to "anything under the sun that is made by man." Diamond v. Chakrabarty, 447 U.S. 303, 309 (1980). "[A] memory containing stored information, as a whole, recite[s] an article of manufacture" and is thus "statutory subject matter." In re Lowry, 32 F.3d 1579, 1582 (Fed. Cir. 1994); In re Warmerdam, 33 F.3d 1354, 1360 (Fed. Cir. 1994) ("Claim 5 is for a machine, and is clearly statutory subject matter.").

Claim 133 recites a computer-readable medium comprising watermarked title data. The definition of an article of manufacture established in In re Lowry, includes a "memory containing stored information." The "computer-readable medium" recited in claim 133 is one form of a memory described in In re Lowry. The watermarked title data is information. Therefore, claim 133 fits squarely within the definition of an item of manufacture provided in In re Lowry.

The computer-readable medium of claim 133 is thus statutory subject matter.

b. Claim 133 Recites a Data Structure

The M.P.E.P. and controlling legal precedent makes clear that data structures are statutory. The Examiner does not question that data structures are patentable. Rather, the Examiner disputes that claim 133 recites a "data structure." Because the computer-readable medium of claim 133 meets the definition of a data structure in the M.P.E.P., the rejection should be reversed.

As defined in the M.P.E.P., a data structure is a "physical or logical relationship among data elements, designed to support specific data manipulation functions." M.P.E.P. 2106.01 (Rev. 5). The claim recites a physical or logical relationship between data elements, which include title data and an identification code used to form the watermark. That relationship includes a modulation scheme expressly recited in the claim. The data elements, and specifically the relationship between the data elements, is designed to support specific data manipulation functions, such as allowing the title data to be converted into an audio or visual display for a user without appreciable distortion by the watermark and to allow the identification code to be extracted by computer processing to authenticate or otherwise identify the source of the title data.

Controlling legal precedent is in agreement. The court in In re Lowry found claims for a "memory for storing data" patentable because they "impart[ed] a physical organization on the information stored in the memory" even though the "physical changes [were] invisible to the eye." In re Lowry, 32 F.3d at 1581, 1583. In the same manner, claim 133 imparts a physical organization of the watermark and the title data on the computer-readable medium. It is this organization that allows a computer to extract the watermark from the watermarked title data.

The computer-readable medium of claim 133 therefore is a data structure and the rejection under 35 U.S.C. §101 should be reversed.

c. Claim 133 Recites Functional Material

The Examiner appears not to challenge that functional material is patentable. Rather, the Examiner found that the watermarked title data was nonfunctional. However, in considering the facts and controlling precedent, it is clear that the watermarked title data is functional.

Controlling precedent makes clear that information can be presented in way that it is functional and therefore patentable. The functionality of the watermarked title data is analogous to that of other inventions approved of by the Court of Customs and Patent Appeals and the Federal Circuit. In In re Miller, 418 F.2d 1392, 1396 (C.C.P.A. 1969), the court found a sufficient functional relationship for an invention consisting of culinary measuring devices marked with fractions that allowed the cook to measure out fractions of recipes. 418 F.2d 1392, 1396 (C.C.P.A. 1969) (finding that the placement of the legends on the receptacles "specifie[d] the required functional relationship"). Further, in In re Gulack, 703 F.2d 1381 (Fed. Cir. 1983), the court found that a sequence of numbers on a band illustrating mathematical properties created a functional relationship between the numbers and the band. 703 F.2d 1381, 1386 (Fed. Cir. 1983). The functional nature arose from the locations of the digits on the band, "each digit residing in a unique position with respect to every other digit." Id. at 1386-87. In the same way as in both In re Miller and In re Gulack, a functional relationship is defined by the position of information in claim 133. Specifically, claim 133 recites the position of the watermark. In the claim, the location of the watermark is defined in relation to the title data. These locations are selected for functional purposes – such as to retain the quality of the data recorded on the computer-readable medium while providing a watermark data that is difficult to detect.

The nature of the watermarking process makes clear that information is positioned for functional purposes. The identification data embedded in the title data on the computer-readable medium is to be processed only by a computer and not the human mind. In fact, the watermark

process is specifically designed to make the identification data imperceptible to the human user of the title data and only available to a computer programmed to extract it.

Thus, it is clear that claim 133 recites an organization of data, to support functions performed by a computer, and therefore defines statutory subject matter. Accordingly, the rejection of claim 133 under 35 U.S.C. §101 should be reversed.

2. Dependent Claim 135

Claim 135 depends directly from claim 133. Claim 135 recites a computer-readable medium comprising a "physical medium." A "physical medium" is clearly an item of manufacture. Thus, in addition to the reasons described above, claim 135 is clearly statutory subject matter. See In re Lowry, 32 F.3d 1579, 1582 (Fed. Cir. 1994).

3. Dependent Claim 136

Claim 136 depends indirectly from claim 133, depending on intervening claim 134. Claim 136 recites a computer-readable medium comprising a "computer disk." A "computer disk" is clearly an item of manufacture. Thus, in addition to the reasons described above, claim 136 is clearly statutory subject matter. See In re Lowry, 32 F.3d 1579, 1582 (Fed. Cir. 1994).

E. Conclusion

For the foregoing reasons, the claims on appeal are not obvious in light of the cited references. Further, all claims define statutory subject matter. Accordingly, the rejections of all claims should be reversed.

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Respectfully submitted,

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CLAIMS APPENDIX

Claims Involved in the Appeal of Application Serial No. 09/826,157

112. A method of watermarking title data with identification data, the method comprising the steps of:

identifying a plurality of possible placement locations in the title data based on characteristics of the title data;

selecting a plurality of placement locations from the plurality of possible placement locations;

randomly selecting a plurality of number to frequency modulation relationships; and

frequency modulating at least a portion of the title data at each of the plurality of selected placement locations with the identification data using one of the selected plurality of number to frequency modulation relationships.

113. The method as claimed in claim 112, further comprising the steps of:

generating a watermarking key that is a combination of the customer identification data and an identifier of the randomly selected plurality of number to frequency modulation relationships; and

storing the watermarking key in a secure database.

114. The method as claimed in claim 113, wherein the step of generating the watermarking key includes generating a unique watermark key for each watermarked title data.

115. The method as claimed in claim 112, wherein the title data is audio title data.

116. The method as claimed in claim 115, further comprising the step of decoding at least a portion of the audio title data.

117. The method as claimed in claim 115, wherein the step of identifying a plurality of possible placement locations includes scanning the audio title data to determine a plurality of locations where a frequency deviation between channels of the audio title data is less than a predetermined frequency deviation or the frequency modulation of the audio title data is not discernible to a human ear.

120. The method as claimed in claim 117, wherein the step of scanning includes selecting a channel of the audio title data as a reference channel, and selecting another channel of the audio title data to be frequency modulated as a watermarked channel.

121. The method as claimed in claim 120, wherein the reference channel and the watermarked channel are randomly changed.

122. The method as claimed in claim 115, further comprising the step of encoding the audio title data after the step of frequency modulating.

123. The method as claimed in claim 122, further comprising the step of combining the frequency modulated audio title data with a remainder of the audio title data to provide watermarked audio title data.

124. The method as claimed in claim 116, further comprising the step of combining the frequency modulated audio title data with corresponding video title data to provide watermarked title data.

125. The method as claimed in claim 112, wherein:

the frequency modulated title data is provided as watermarked title data; and

the method further comprises the step of storing reference title data for use when decoding the watermarked title data.

126. The method as claimed in claim 112, wherein:

the frequency modulated title data is provided as watermarked title data; and

the method further comprises the step of burning a selected medium with the watermarked title data.

127. The method as claimed in claim 112, wherein:

the frequency modulated title data is provided as watermarked title data; and

the method further comprises transmitting the watermarked title data to a customer.

128. The method as claimed in claim 112, further comprising the step of receiving an decryption key and decrypting encrypted title data to provide the title data.

129. The method as claimed in claim 112, further comprising the step of decoding encoded title data to provide the title data.

130. The method of watermarking title data of claim 112, wherein randomly selecting a plurality of number to frequency modulation relationships comprises selecting an entry of a set of encoding relationships, the entry including random information specifying a selection of placement locations from the plurality of placement locations.

131. The method of claim 130, wherein each of the encoding relationships comprises the plurality of number to frequency modulation relationships.

132. The method of claim 131, wherein selecting a plurality of placement locations comprises selecting a plurality of placement locations using information stored in the selected entry of the set of encoding relationships.

133. Computer-readable medium comprising watermarked title data that is watermarked with an identification code, the title data having at a plurality of locations the identification code

modulated on the title data, with a different modulation scheme at each of the plurality of locations creating a random relationship between the identification code and modulation at each of the plurality of locations, and each of the plurality of locations being a random location within a group of available placement locations at which the watermarked title data has properties meeting at least one criterion.

134. The computer-readable medium of claim 133, wherein the title data is audio data and the modulation schemes used to modulate the title data alter the title data by a sufficiently small amount that the modulated data is not perceptible to a human listener of the audio title data.

135. The computer-readable medium of claim 133, wherein the computer-readable medium comprises a physical medium.

136. The computer-readable medium of claim 134, wherein the computer-readable medium comprises a computer disk.

137. The computer-readable medium of claim 133, wherein the computer-readable medium comprises data transmitted over a network.

138. The computer-readable medium of claim 133, wherein the plurality of locations have random positions on the computer-readable medium.

139. The computer-readable medium of claim 133, wherein the different modulation schemes are random.

140. A method of watermarking title data with identification data, the method comprising:
identifying a plurality of locations in the title data based on properties of the title data;
randomly selecting a subset of placement locations from the plurality of identified locations;
for each placement location in the subset:

(i) randomly selecting one of a plurality of number to frequency modulation relationships;

(ii) modulating the title data at the placement location with the identification data based on the selected number to frequency modulation relationship; and

storing an indication of the randomly selected subset of placement locations and randomly selected number to frequency modulation relationships.

141. The method as claimed in claim 140, further comprising the step of receiving an decryption key and decrypting encrypted title data to provide the title data.

142. The method as claimed in claim 115, further comprising the step of receiving an decryption key and decrypting encrypted title data to provide the title data.

143. The method as claimed in claim 117, further comprising the step of receiving an decryption key and decrypting encrypted title data to provide the title data.

144. The method as claimed in claim 112, wherein the step of identifying a plurality of possible placement locations includes scanning the title data to identify locations based on a frequency deviation.

145. The method as claimed in claim 144, wherein selecting a plurality of placement locations comprises randomly selecting a subset of the plurality of possible placement locations.

146. The method as claimed in claim 112, wherein selecting a plurality of placement locations comprises randomly selecting a subset of the plurality of possible placement locations.

VIII. EVIDENCE APPENDIX

No evidence pursuant to §§ 1.130, 1.131, or 1.132 entered by or relied upon by the Examiner is being submitted.

IX. RELATED PROCEEDINGS APPENDIX

No related proceedings are referenced in II. above and no copies of decisions in related proceedings are being submitted.